

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Present Application:

Applicants : Simone Mazzoni et al.
Title : GENERATION OF A GUARD INTERVAL IN A DMT
MODULATION TRANSMISSION
Docket No. : 859063.462C1
Date : January 21, 2004

Prior Application:

Examiner : Man U. Phan
Art Unit : 2665
Application No. : 09/491,685

Mail Stop Patent Application
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRELIMINARY REMARKS

Commissioner for Patents:

The following remarks are in response to the final Office Action issued on October 21, 2003 in the parent application 09/491,685.

Claims 1-17 are pending. Claims 1-4, 6-9, and 11-17 are identical to claims 1-14 of the parent application, as amended by the Amendment filed on May 12, 2003. Claims 5, 10, and 17 are new claims.

Claims 1, 3, 5, 7, 9, and 11-12 of the parent case (corresponding to current claims 1, 3, 6, 8, 11, and 13-14) were rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,682,376 to Hayashino *et al.* ("Hayashino") in view of U.S. Patent No. 4,112,430 to Ladstatter.

The applicants respectively submit that the Examiner's analysis of the prior art and the rejected claims is incorrect for at least the following reasons:

- 1) there is no explanation of why one skilled in the art would be motivated to combine Ladstatter with Hayashino;
- 2) there is no explanation of how one would combine Ladstatter with Hayashino without making large, un-suggested changes in the circuits of Ladstatter and Hayashino;
- 3) even if one combined Hayashino with Ladstatter, there is no prior art teaching one to keep as a cyclic prefix any portion of the phase-shifted signals of Ladstatter; and
- 4) contrary to the assertion in the sentence bridging pages 3-4 of the Office Action, the applicants did not admit that Ladstatter's teaching of the phase shifters ... into Hayashino's circuit ... meet the limitations of the claims and improved the prior art's OFDM transmission reliability.

Lack of Motivation to Combine

In the previous Amendment, the applicants pointed out several reasons why there would have been no motivation to combine Hayashino and Ladstatter. In particular, A) the prior art does not recognize any of problems of the Hayashino DMT modulation transmission system, such as the delays and large memory usage inherent in Hayashino; B) Ladstatter does not recognize any problems or suggest any improvements in DMT modulation transmission because Ladstatter deals with beam orientation in devices such as solid state radars; and C) the reason for phase-shifting stated in Ladstatter – to compensate for different arrival times of the beam at the respective sensors (col. 2, lines 36-42) – is completely irrelevant to the data transmissions of Hayashino and the claimed invention.

In the final Office Action, the Examiner acknowledges that there must be some teaching, suggestion, or motivation to combine the teachings of the prior art, but fails to point to such a teaching, suggestion, or motivation to combine. The Examiner does not indicate that the prior art recognizes problems with Hayashino's system, does not explain why one would look to a solid state radar device like Ladstatter to improve on a DMT modulation transmission system like Hayashino, and does not address the fact that Ladstatter's reason for phase shifting is

irrelevant to the data transmissions of Hayashino and the claimed invention. Instead, the Examiner merely points to alleged features of Hayashino and Ladstatter without pointing out why one skilled in the art would combine those features to obtain the claimed invention.

The only item that the applicants have found in the final Office Action related to motivation is the statement on pages 6-7 that “one skilled in the art would have recognized the need for effectively and efficiently generating guard interval in DMT modulation transmission, and would have applied Ladstatter’ teaching of the phase shifter in associated with the frequency of the Fourier coefficient into Hayashino’s circuit for generating a cyclic prefix of a symbol in an OFDM modulation transmission.” The applicants respectfully submit that the quoted statement is a conclusion without any reasons being specified. In particular, why would one skilled in the art have recognized the need for effectively and efficiently generating a guard interval when neither Hayashino nor Ladstatter mentions any problem with Hayashino’s method of generating a guard interval? In addition, the quoted statement does not explain why one would have applied Ladstatter’s teaching of a phase shifter, especially in light of the fact that Ladstatter is directed to a solid state radar device and the fact that Ladstatter’s reason for phase shifting is irrelevant to the data transmissions of Hayashino and the claimed invention.

The rejected claims are nonobvious in view of Hayashino and Ladstatter because there is no motivation for combining Ladstatter with Hayashino.

Lack Of Explanation Of How To Combine The Prior Art Teachings

Even if a person skilled in the art recognized any need for effectively and efficiently generating a guard interval in DMT modulation transmission, it unclear how that person could or would combine the teachings of Ladstatter with those of Hayashino to create the claimed invention. It is not possible to produce a symbol corresponding to one symbol of Hayashino with the circuit of Ladstatter. To produce said symbol, it would at least be necessary to alter the circuit of Fig. 1 of Ladstatter as follows: replacing the FFT bloc 16 by the serial to parallel converter of Hayashino, suppressing the FFT blocs 17, 18, 19; modifying the phase shifter blocs 21, 22, 23, 24 so that they phase shift only one narrowband signal each; and

suppressing the summer blocs 60, 61, 62, 63. Nothing in Ladstatter or Hayashino suggests to implement such alterations.

Failure To Disclose Keeping As A Cyclic Prefix Any Portion Of The Phase-Shifted Signals Of Ladstatter

Even if one made the above modifications to Ladstatter to combine it with Hayashino, one would still not be motivated to keep as a cyclic prefix any portion of the phase-shifted signals of Ladstatter. Ladstatter explicitly teaches away from retaining phase-shifted portions of his signal. Ladstatter teaches that the complex multiplications of the narrowband signals introduce a circular shift in the output wideband signal that creates signal distortion. The portions of the output wideband signal that are circularly shifted are therefore “gated off or otherwise removed” (column 4, lines 37-40). Thus, Ladstatter explicitly discards the circularly shifted portion of the signal rather than keeping it as a cyclic prefix of a data symbol being transmitted. Nothing in Hayashino suggests otherwise.

Lack Of Admissions By The Applicants

The applicants did not admit that Ladstatter’s teaching of the phase shifters ... into Hayashino’s circuit ... meet the limitations of the claims and improved the prior art’s OFDM transmission reliability. In the previous Amendment, the applicants discussed advantages provided by one embodiment of the invention (page 7) and reasons why one skilled in the art would not be motivated to combine Hayashino and Ladstatter (pp.7-8), would not know how to combine Hayashino and Ladstatter (pp. 8-9), and would not achieve the claimed invention if Hayashino and Ladstatter were combined (p. 9). Nothing in those arguments or the application itself provides any admission regarding the ability of the prior art to meet the limitations of the claims or regarding any improvements provided by the prior art. If the Examiner continues to assert that the applicants have made any admissions, the applicants respectfully request the Examiner to particularly point out where such admissions have been made.

In summary, all of the pending claims are nonobvious in view of Hayashino and Ladstatter.

Claims 2, 4, 6, 8, 10, and 13-14 (currently claims 2, 4, 9, 12, and 15-16) were rejected under 35 U.S.C. § 103 as being unpatentable over Hayashino and Ladstatter in view of U.S. Patent No. 6,285,654 to Marchok *et al.* ("Marchok").

The cited prior art does not teach or suggest the invention recited in the rejected claims. In particular, Marchok does not provide any motivation for combining Hayashino and Ladstatter and does not provide any teaching of how to combine Hayashino and Ladstatter to create the claimed invention. In particular, nothing in Marchok suggests looking to a beamformer for wideband radar signals, like Ladstatter, for a solution to any problems associated with DMT modulation transmission. As a result, the rejected claims are nonobvious in view of the cited prior art.

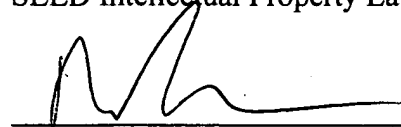
New claims 5, 10, and 17 respectively depend on claims 1, 6, and 11, and thus, are nonobvious over the cited prior art for the reasons expressed above. In addition, claims 5, 10, and 17 recite additional elements not found in the cited prior art. For example, claim 5 recites that the shifting means delays the symbol only by the duration of said prefix and the memory stores only the shifted samples without storing any of the samples of the symbol other than the shifted samples. Claims 10 and 17 recite similar features. Neither Hayashino nor Ladstatter teaches or suggests such features. Instead, as discussed above, two problems with Hayashino are the long delay and large memory usage caused by Hayashino's storage of all of the samples of the symbol. Ladstatter does not suggest any solutions. Accordingly, claims 5, 10, and 17 are nonobvious in view of the cited prior art.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

All of the claims remaining in the application are now clearly allowable.
Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

SEED Intellectual Property Law Group PLLC

A handwritten signature in dark ink, appearing to read 'Robert Iannucci', is written over a horizontal line.

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